a) a monolithic body of ceramic material having an inlet at one end adapted for connection in fluid communication with precision dispensing apparatus and having an outlet at another end of the body; and

b) a fluid conducting passage in the body for connecting the inlet to the outlet, the passage being shaped to conduct fluid from the inlet to the outlet in a continuous and uninterrupted manner, said passage having a portion converging in a direction immediately from the inlet and extending toward the outlet.

Remarks

This amendment is made for the purpose of placing the claims in better form for consideration by the Examiner and entry of this amendment under the provisions of 37 CFR 1.116 is respectfully requested.

Reconsideration of the rejection of claims 1, 3-5, 9-11 and 16 under 35 USC 102 based on Richter is respectfully requested for the following reasons. Richter discloses a nozzle for modulating flow of molten metal from a tundish in a continuous casting system. Applicant's invention, on the other hand, is a precision dispensing tip for dispensing small amounts of fluid, for example viscous materials such as adhesive on printed circuit boards, where it is important to provide consistent shapes of the material applied to a series of locations on a

surface and to do so at a relatively fast rate of travel from location to location. Richter does not disclose a precision dispensing tip in the manner provided by applicant's invention, and independent claims 1 and 9 are amended to emphasize this distinction over Richter.

Contrary to the Examiner's description of the Richter apparatus, the inlet of Richter is not the inlet to section B. Richter states in col. 6 at line 44 that the inlet is "nozzle inlet portion 31". Thus, the converging passage portion B is spaced by portion A a considerable distance from inlet 31. Accordingly, Richter does not disclose a passage portion converging immediately from the inlet as claimed by applicant.

Responsive to the Examiner's comment on the top of page 3 of the Office Action, part d) of claim 1 has been amended to relate the recitation dealing with the diameter of drop of viscous fluid to the diameter of the outlet thereby associating the language of the last five lines of part d) of claim 1 to structure of the tip and thereby giving patentable weight to that language.

Claim 9 has been amended further to call for the tip body being a monolithic body of ceramic material in sharp contrast to the nozzle of Richter which is a composite of three layers 32, 34 and 38.

Richter is concerned with the considerably different problem of destructive cracking in a nozzle which handles a relatively large volume flow of molten metal, such cracking

being caused by large thermal gradients giving rise to different rates of thermal expansion in the shells or layers of a nozzle composite body. Applicant's invention, on the other hand, is directed to the problem of avoiding discontinuities in the fluid flow and avoiding introduction of turbulence to the fluid flow in a tip for dispensing small amounts of fluid in consistent sizes and shapes to a series of locations along a surface. It is submitted that one skilled in the art, seeking to solve the problem to which applicant's invention is directed, would not look to the significantly different art represented by Richter which deals with avoiding destructive cracking in a nozzle handling relatively large volumes of flow of molten metal.

In view of the foregoing, claims 1, 3-5, 9-11 and 16 as amended are believed to patentably distinguish over Richter within the meaning of 35 USC 102 and 35 USC 103.

Reconsideration of the rejection of claim 1 under 35 USC 103 based on Tomasello is respectfully requested for the following reasons. Tomasello is directed to a nozzle for use in fluid stripping apparatus, such as that found in automatic vehicle car washes for stripping rinse water from the vehicle surface, employing air at high velocity and high pressure. Thus, Tomasello does not disclose a precision dispensing tip as claimed by applicant.

Responsive to the Examiner's comment at the bottom of page 3 and top of page 4 of the Office Action, part d) of claim 1 has been amended to relate the recitation dealing with the diameter of drop of viscous fluid to the diameter of the outlet thereby

associating the language of the last five lines of part d) of claim 1 to structure of the tip and thereby giving patentable weight to that language.

Tomasello is directed to the considerably different problem of providing "a fluid stripping apparatus which projects air from a nozzle much further than conventional apparatus without appreciable loss of velocity to deliver a high-volume, high-pressure flow of air at low horsepower and which can strip fluids from a surface at a distance." It is submitted that one skilled in the art, seeking to solve the problem to which applicant's invention is directed, would not look to the significantly different art represented by Tomasello which deals with a nozzle for handling a large volume of air.

In view of the foregoing, amended claim 1 is believed to patentably distinguish over Tomasello within the meaning of 35 USC 103.

Reconsideration of the rejection of claims 1, 6 and 7 under 35 USC 103 based on Heron et al. in view of Vickers is respectfully requested for the following reasons. The Heron et al. patent indicates in col. 1 at lines 55, 56 and in claim 1, the first three lines, that section 1 is the inlet. The converging section 5 is spaced from inlet section 1 by the mid-stream section 2 which is of significant axial length. Thus Heron et al. do not disclose a passage portion converging in a direction immediately from the inlet as called for in claim 1. This immediate converging is important to insure the continuous

and uninterrupted flow called for in applicant's claimed invention.

Responsive to the Examiner's comment, near the end of page 4 of the Office Action, part d) of claim 1 has been amended to relate the recitation dealing with the diameter of drop of viscous fluid to the diameter of the outlet thereby associating the language of the last five lines of part d) of claim 1 to structure of the tip and thereby giving patentable weight to that language. Vickers, which discloses a cavitation nozzle for a high velocity jet of fluid having both diverging 22 and converging 24 sections separated by a constant diameter section 26, is not believed to disclose anything having a bearing on the reasons why amended claim is believed to patentably distinguish over Heron.

Accordingly, claim 1 as amended and dependent claims 6 and 7 are believed to patentably distinguish over Heron et al. and Vickers within the meaning of 35 USC 103.

The rejection of claims 2 and 12 under 35 USC 103 based on Richter is respectfully traversed. Dependent claims 2 and 12 include all the limitations of amended claims 1 and 9, respectively, which for the reasons set forth above are believed to patentably distinguish over Richter within the meaning of 35 USC 103.

The rejection of claims 14 and 15 under 35 USC 103 based on Richter in view of Vickers is respectfully traversed. Dependent claims 14 and 15 include all the limitations of amended claim 9

which, for the reasons set forth above, is believed to patentably distinguish over Richter within the meaning of 35 USC 103.

Replacement claim pages are included herewith.

Favorable action on this application is respectfully requested.

Respectfully submitted,

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